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(54) Systems and methods for smart media content thumbnail extraction

(57) Systems and methods for smart media content thumbnail extraction are described. In one aspect program metadata is generated from recorded video content. The program metadata includes one or more key-frames from one or more corresponding shots. An objectively representative key-frame is identified from among the key-frames as a function of shot duration and frequency of appearance of key-frame content across multiple shots. The objectively representative key-frame is an image frame representative of the recorded video content. A thumbnail is created from the objectively representative key-frame.

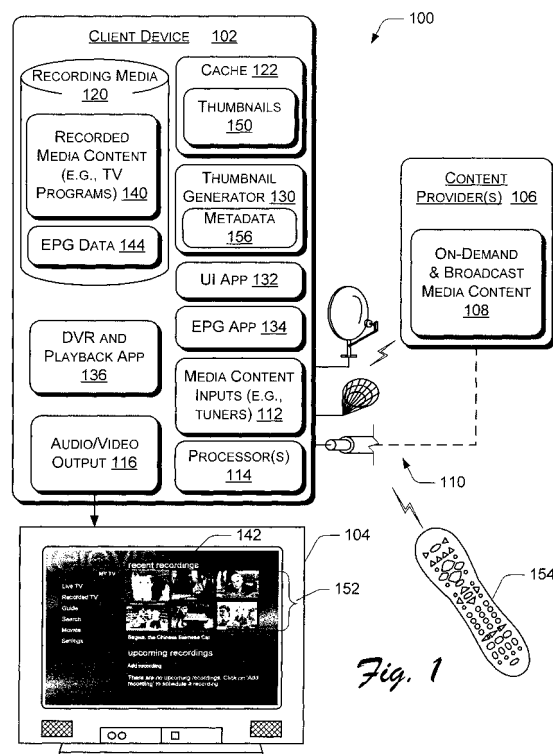


Fig. 1



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EUROPEAN SEARCH REPORT

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EP 05 10 7085

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	ZHANG Y J ET AL: "A hierarchical organization scheme for video data" PATTERN RECOGNITION, ELSEVIER, KIDLINGTON, GB, vol. 35, no. 11, November 2002 (2002-11), pages 2381-2387, XP004819279 ISSN: 0031-3203	1-4, 8-12, 16-20, 24-26,30	G06F17/30 G11B27/28 G11B27/10
Y	* the whole document *	5,13,21, 27	
X	ANONYMOUS: "Advanced Digital Video Storage and On-line Retrieval system" ADVISOR PROJECT, [Online] 30 June 2002 (2002-06-30), XP002362990 Retrieved from the Internet: URL:http://advisor.matrasi-tls.fr/DUP_workshop_sheet.pdf> [retrieved on 2006-01-16] * the whole document *	1-4, 6-12, 14-20, 22-26, 28-30	
Y	US 2002/157116 A1 (JASINSCHI RADU SERBAN) 24 October 2002 (2002-10-24) * paragraph [0004] * * paragraph [0039] *	5,13,21, 27	TECHNICAL FIELDS SEARCHED (IPC) G11B G06F
X	EP 0 597 450 A (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD) 18 May 1994 (1994-05-18) * abstract *	1-4, 8-12, 16-20, 24-26,30	
A	BERTINI M ET AL: "Indexing for reuse of TV news shots" PATTERN RECOGNITION, ELSEVIER, KIDLINGTON, GB, vol. 35, no. 3, March 2002 (2002-03), pages 581-591, XP004323396 ISSN: 0031-3203 * paragraph [0003] *	6,7,14, 15,22, 23,28,29	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 16 January 2006	Examiner Valencia, E
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 10 7085

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	LEE M-S ET AL: "Automatic video parsing using shot boundary detection and camera operation analysis" PATTERN RECOGNITION, ELSEVIER, KIDLINGTON, GB, vol. 34, no. 3, March 2001 (2001-03), pages 711-719, XP004321298 ISSN: 0031-3203 * the whole document * -----	1-30	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		16 January 2006	Valencia, E
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 10 7085

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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16-01-2006

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002157116 A1	24-10-2002	CN 1535431 A	06-10-2004
		WO 0210974 A2	07-02-2002
		EP 1405214 A2	07-04-2004
		JP 2004505378 T	19-02-2004

EP 0597450 A	18-05-1994	DE 69333177 D1	09-10-2003
		DE 69333177 T2	22-04-2004
		KR 215586 B1	16-08-1999
